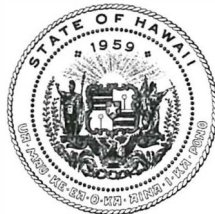


DAVID Y. IGE  
GOVERNOR OF  
HAWAII



**DEPT. COMM. NO. 39**

SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA  
FIRST DEPUTY

M. KALEO MANUEL  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

**STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES**

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

December 2, 2019

The Honorable Ronald D. Kouchi,  
President  
and Members of the Senate  
Thirtieth State Legislature  
State Capitol, Room 409  
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki, Speaker  
and Members of the House of  
Representatives  
Thirtieth State Legislature  
State Capitol, Room 431  
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of the Budgetary and Other Issues Regarding Invasive Species report, as required by Section 194-2, Hawaii Revised Statutes (HRS). In accordance with Section 93-16, HRS, a copy of this report has been transmitted to the Legislative Reference Bureau and the report may be viewed electronically at <http://files.hawaii.gov/dlnr/reports-to-the-legislature/2020/FW20-Invasive-Species-Report-FY19.pdf>.

Sincerely,

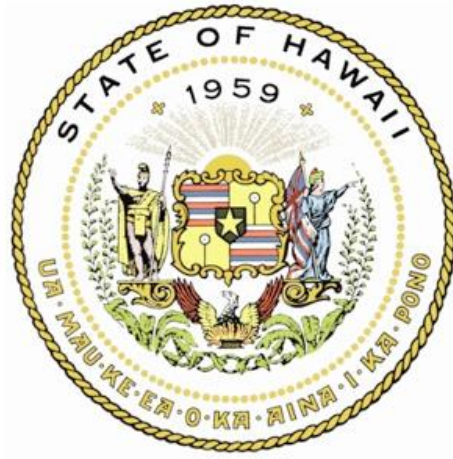
A handwritten signature in blue ink, appearing to read "Suzanne D. Case".

SUZANNE D. CASE  
Chairperson

Enclosure

**REPORT TO THE THIRTIETH LEGISLATURE  
STATE OF HAWAII  
2020 REGULAR SESSION**

**BUDGETARY AND OTHER ISSUES REGARDING INVASIVE SPECIES**



Prepared by:

**THE STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE**

In response to Section 194-2, Hawaii Revised Statutes

Honolulu, Hawaii  
November 2019

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2020 Executive Summary

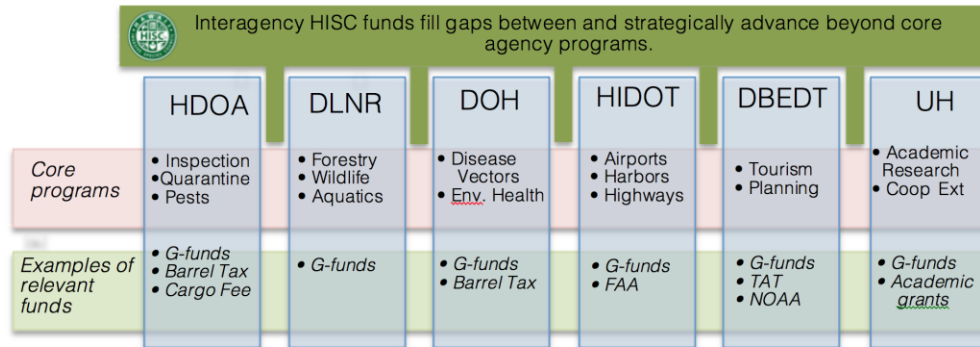
# HAWAII INVASIVE SPECIES COUNCIL

PROVIDING STATE POLICY DIRECTION, COORDINATION, AND PLANNING TO PROTECT HAWAII FROM THE IMPACTS OF INVASIVE SPECIES

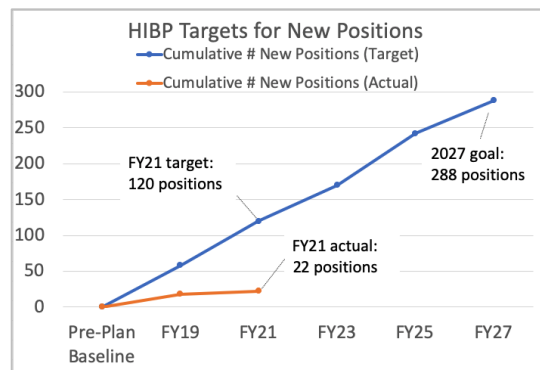


### BUDGETARY ISSUES RELATING TO INVASIVE SPECIES

- State agencies largely address invasive species through existing programs funded by departmental budgets. A 2015 report by the Legislative Reference Bureau found that in FY14, \$19.6M (0.15% of a total \$13B state budget) in state funding was provided for invasive species programs at state agencies.
- HISC funds support interagency projects and new research that help fill the gaps between permanent programs. In 2019 the legislature provided \$5.75M to the HISC, a \$1M increase from FY19, for research and interagency projects, as well as several other specific appropriations to various agencies.

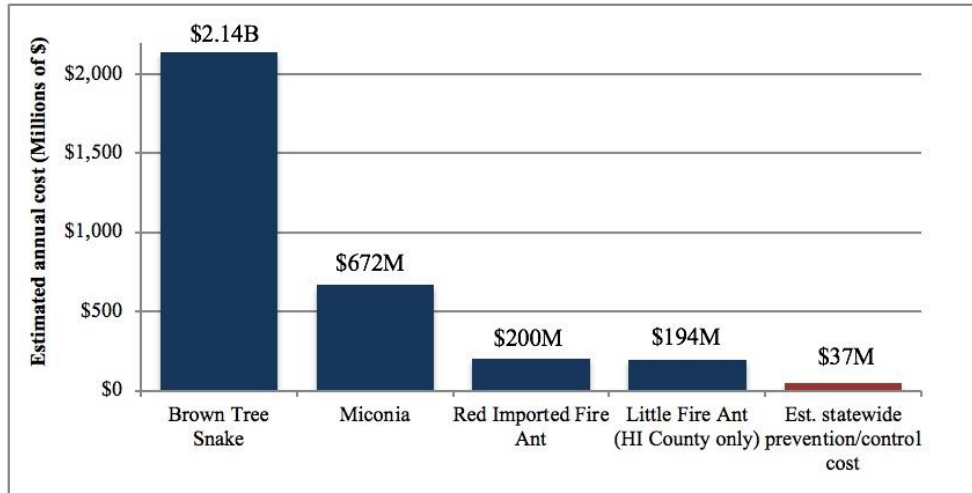


- In FY20 the HISC received 50 requests for research and interagency projects not covered by existing agency programs or funds, totaling \$8.8M
- **The primary biosecurity need moving forward is civil service capacity.** Positions will be needed at HDOA for commodity inspection and response, positions at DLNR DAR for hull inspection, positions at DLNR DOFAW for control of invasives in our most vulnerable natural areas, and funding for new biocontrol research facilities.



**THE COST OF INACTION: ECONOMIC DAMAGES FROM INVASIVE SPECIES**

Economic impacts from a sample of invasive species below, including estimated damages from species that are already in Hawaii (*Miconia* and little fire ant), as well as potential damages from species that have so far been kept from establishing (brown tree snake and red imported fire ant).



*L to R: brown tree snake impact (\$2.14B/yr in infrastructure, health costs, tourism), Miconia impacts (\$672M/yr in lost water recharge, bird habitat); RIFA cost (\$200M/yr in lost tourism, agriculture); LFA cost, HI County only (\$194M/yr in costs to various sectors); estimated **additional** annual need for invasives programs (HIBP). References available in full 2019 legislative report at <http://hisc.hawaii.gov>.*

**ADVICE REGARDING INVASIVE SPECIES IN THE 2020 LEGISLATURE**

The primary recommendation of the HISC to the legislature in 2020 is to **continue to implement the Hawaii Interagency Biosecurity Plan (HIBP)**, the State's 10-year vision roadmap to enhance biosecurity and invasive species mitigation (<http://dlnr.hawaii.gov/hisc/plans/hibp/>).

| <b>Biosecurity Plan Legislative Goals: Past Successes (2017-18)</b>               |  |
|---|--|
| • Fully restored the Vector Control Branch at Department of Health                | • Appropriated planning funds for a new HDOA Biological Control facility             |
| • Approved HDOA to use transitional facilities for commodity inspection           | • Added two positions for UH Hawaii Ant Lab to expand services in Kona               |
| • Provided stable funds to the HISC by adding annual appropriation to base budget | • Provided funds for rapid ohia death, rat lungworm, parakeets, & coffee berry borer |
| <b>Biosecurity Plan Successes from the 2019 Legislature</b>                       |  |
| • 4 specialist positions for HDOA imports   | • CIP funds for dog kennels, coqui barrier, predator proof fencing                   |
| • Increased HISC funding by \$1M  | • Increased CIP funds for watershed fencing for invasive animals                     |
| <b>Examples of Remaining Biosecurity Plan Legislative Needs</b>                   |  |
| • Add additional positions for commodity inspections at HDOA Plant Quarantine     | • Add DLNR DOFAW field technicians for invasives control in natural areas            |
| • Add additional positions at HDOA Plant Pest Control Branch                      | • Add positions and fee collection for DLNR DAR vessel hull inspection program       |
| • Construction funds for biological control facility                              | • Move enforcement of HDOA import laws under the new Environmental Court             |

The 2020 legislative report *Budgetary and Other Issues Regarding Invasive Species* includes further details on the Hawaii Interagency Biosecurity Plan, the use of HISC funds in FY19, and provides a list of invasive species bills from the previous legislative session and their fates. For more information, visit <http://hisc.hawaii.gov>.

# 1. Hawaii Invasive Species Council Actions in FY19

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## 1.1 Purpose of this Report

Invasive species are non-native species whose introduction does, or is likely to, cause economic or environmental harm or harm to human health. Invasive species do not fall exclusively under the mandate of any single state agency. Recognizing this, the State Legislature in 2003 authorized the creation of the interagency Hawaii Invasive Species Council (HISC, Act 85, Session Laws of Hawaii 2003), and stated, “the silent invasion of Hawaii by alien invasive species is the single greatest threat to Hawaii’s economy, natural environment, and the health and lifestyle of Hawaii’s people and visitors.”



This document meets the reporting requirements of Section 194-2, HRS, to annually report to the Legislature on budgetary and other issues regarding invasive species. Per Chapter 194, HRS, the HISC is an interagency board placed within the Department of Land and Natural Resources (DLNR) for administrative purposes.

## 1.2 Composition and Function of the HISC

Chapter 194, HRS, requires that the HISC be composed of the chairs, directors, or designees of the agencies below. In FY19 the Council was composed of:

- Suzanne D. Case, DLNR
- Scott Enright and Phyllis Shimabukuro-Geiser, Hawaii Department of Agriculture (HDOA)
- Keith Kawaoka, Department of Health (DOH)
- Leo Asuncion and Mary Alice Evans, Department of Business, Economic Development, and Tourism (DBEDT)
- Nicholas Comerford, University of Hawaii (UH)
- David Rodriguez, Department of Transportation (DOT)

Additionally, legislators and federal agency partners are invited as non-voting participants to provide advice and guidance to the HISC. FY19 legislative appointees included:

- Senators Ronald Kouchi, Mike Gabbard, J. Kalani English, and Lorraine Inouye
- Representatives Nadine Nakamura, Chris Lee, Tina Wildberger, and Nicole Lowen.

The HISC’s function is to coordinate and promote invasive species prevention, control, outreach and research. Chapter 194, Hawaii Revised Statutes (HRS), establishes the interagency HISC, and determines its composition and responsibilities. Several key responsibilities of the HISC include:

- Advise, consult, and coordinate invasive species-related efforts with and between departments. This is achieved through the actions of the Council (Section 1.3 of this report), the staff support program (Section 1.4), and interagency projects funded by the HISC (Section 2.2).
- Identify agency resource shortfalls with respect to invasive species. This is achieved by tracking implementation progress of the Hawaii Interagency Biosecurity Plan (Section 1.5).
- Coordinate and promote the State’s position with respect to invasive species issues. This is achieved by adopting Council resolutions (Section 3.1) and testimony (Section 3.2)
- Advise the governor and legislature on budgetary and other issues regarding invasive species. This is achieved by this report, particularly Section 3.

## 1.3 Council Meetings in FY19

All HISC meeting agendas and notes are available at <http://dlnr.hawaii.gov/hisc/meetings/>.

- August 14, 2018: The HISC addressed the following agenda items:



- Reviewed and approved a FY19 budget for research and interagency projects. Approved projects are summarized in Section 2.2 of this report.
- Reviewed an annual work plan for staff supporting the HISC
- Received a presentation on progress toward landscape-scale mosquito control technology
- January 29, 2019: The HISC met to discuss the following agenda items:
  - Received a progress update on implementation of the Hawaii Interagency Biosecurity Plan (progress report available at <http://dlnr.hawaii.gov/hisc/plans/hibp/>)
  - Received a presentation on ballast water, biofouling, and the federal Vessel Incidental Discharge Act
  - Received a presentation from the Research & Technology Working Group regarding their position paper, [Understanding the Value of Glyphosate in Protecting Hawaii](#)
  - Adopted [Resolution 19-1: Supporting the use of best available science in regulation of herbicides and recognizing the utility of glyphosate as a tool for invasive species control](#)
  - Adopted [Resolution 19-2: Supporting the keeping of pet cats indoors and the use of peer-reviewed science in pursuing humane mitigation of the impacts of feral cats on wildlife and people.](#)

#### **1.4 HISC Support Program Projects in FY19**

The directions of the HISC are carried out by staff of the HISC Support Program, which is administered by the Invasive Species Coordinator at the DLNR Division of Forestry and Wildlife (DOFAW). Other HISC Support staff are provided by the UH Pacific Cooperative Studies Unit and are supported on a year-to-year basis utilizing funds appropriated to HISC by the legislature. HISC funds are administered by DLNR DOFAW under the Native Resources and Fire Protection Program (Program ID LNR402). The HISC Support Program provides a number of core coordination services across agencies in addition to managing the process of disbursing funds to interagency projects. In FY19, core coordination areas of the HISC Support Program included:

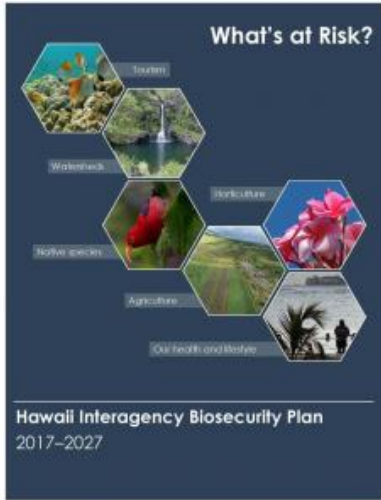
- [Online Pest Reporting via 643pest.org](#): This service provides an online complement to the 643-PEST telephone hotline. Access is also provided via a 643PEST mobile app on iOS and Android platforms. These services are free to the public and allow the submission of invasive species observation reports. After receiving a report via the online system, trained facilitators help direct reports to appropriate agencies, where determination can be made as to whether a field response is required. This service is available at <http://643pest.org>
- [Mamalu Poepoe](#): This interagency project supports invasive species monitoring at airports, utilizing resources across HISC's constituent agencies. The project was developed by the Hawaii Department of Health (HDOH), Hawaii Department of Agriculture (HDOA), Hawaii Department of Transportation (HIDOT), and the University of Hawaii (UH). The five-year pilot project began in 2016 and boosts monitoring efforts for four key invasive taxa at airports to learn about relative costs and benefits of airport biosecurity. Analyzed taxa include invasive ants, mosquitoes, Africanized honeybees, and coconut rhinoceros beetle. More details on the project are available at <http://dlnr.hawaii.gov/hisc/mp/>.
- [Hawaii Invasive Species Awareness Month \(HISAM\) 2019](#): Governor Ige proclaimed February 2019 as the 7<sup>th</sup> annual HISAM and the HISC, in partnership with members of the legislature, distributed the 2019 "HISC Awards" for people or organizations that have made substantial contributions to addressing the invasive species problem. Volunteer events were held statewide. Details on 2019 awardees are available at <http://dlnr.hawaii.gov/hisc/hisam2019/>.
- [Support for the Western Governors' Association \(WGA\) Biosecurity and Invasive Species Initiative \(BISI\)](#): Governor Ige became the chair of the Western Governors' Association in July 2018 and launched the BISI as his chairperson's initiative. HISC staff provided logistical and technical support for the initiative, which included four workshops across the western US and

several webinars on invasive species topics. A final report and [a policy resolution](#) were produced in support of:

- Development of regional biosecurity research facilities in Hawaii
- Better federal recognition of state biosecurity needs, and
- Improved consideration of Hawaii and the Pacific in quarantine and inspection processes.

More details on the WGA BISI are available at <http://dlnr.hawaii.gov/hisc/news/wga-final/>.

### 1.5 Hawaii Interagency Biosecurity Plan Implementation



The Hawaii Interagency Biosecurity Plan (HIBP) provides a ten year roadmap (2017-2027) for the State of Hawaii to enhance its core biosecurity programs across multiple agencies and direct future research and development to protect our agriculture, natural resources, human health, tourism, and way of life in the islands. Achievements in the HIBP are made by agency staff and by the legislature, with HISC providing tracking and reporting of implementation progress.

The HIBP is comprehensive in scope, defining "biosecurity" as the full set of policies and actions taken to mitigate the impacts from invasive species. This includes pre-border biosecurity (e.g., offshore compliance), border biosecurity (e.g., inspection and interception), and post-border biosecurity (e.g., early detection, rapid response, and biocontrol). The final result is a matrix of 147 action items, each assigned to a lead agency and associated with an estimated cost and implementation timeframe.

The HISC produces progress reports on implementation every six months. These reports are available at <http://dlnr.hawaii.gov/hisc/plans/hibp/>. As of July 2019, 32% of the actions in the HIBP were completed or are ongoing tasks that are being addressed in perpetuity, with another 23% in progress toward an eventual completion state. The remaining 45% of actions have not yet been started. Additional information on remaining legislative goals of the HIBP can be found in Section 3 of this report.

## 2. Budgetary Issues Relating to Invasive Species

### 2.1 Agency Resources & Shortfalls Relating to Invasive Species

The Legislative Reference Bureau released a 2015 report, titled [Can't see the Forest for the \(Albizia\) Trees: An Invasive Species Update](#), that was commissioned as an update to the 2002 report [Filling the Gaps in the Fight Against Invasive Species](#). The report details the roles, resources, and shortfalls of government agencies in great detail.

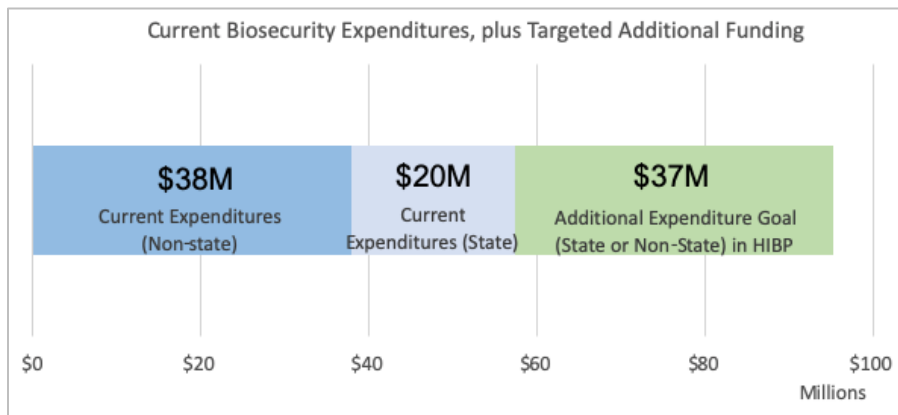


Figure 1: “Current” biosecurity annual expenditures per the 2015 Legislative Reference Bureau Report (FY14), with estimated additional annual expenditure target recommended by the Hawaii Interagency Biosecurity Plan. HIBP costs can be supported by State or non-State funding sources.



Most biosecurity or invasive species efforts are addressed by permanent departmental programs, rather than reliant on the interagency “gap filling” project funds provided by HISC. Continued support for, and enhancement of, departmental programs is critical to making sure that basic infrastructure exists for invasive species prevention and control in Hawaii. A brief summary of permanent biosecurity or invasive species programs at individual State departments is available at <https://dlnr.hawaii.gov/hisc/info/policy/>.

**2.2 HISC Funding & FY19 Funded Projects**

The HISC administers an interagency budget that supplements existing departmental programs by strategically filling gaps between mandates, and by funding research to address new threats or develop new tools. State agencies, including the UH system, apply for HISC funds on a competitive basis annually. Counties, local offices of federal agencies, and universities in other states are also eligible.

In FY19, the legislature included the amount of \$4.75M per year in the base operating budget. Requests for funds from interagency projects are typically around \$9M annually. HISC tends to accommodate a larger number of projects at partial funding rather than providing the full amount of requested funds to a small number of projects. This strategy encourages the use of matching funds and provides the broadest impact possible for HISC funds.

Summary statistics for acres surveyed and treated for invasive species are presented below. It should be noted that the acres treated figure is intentionally much less than the acres surveyed: the strategy pursued by many of funded projects is to survey broadly in order to provide sufficient detection effort, but treat strategically. This allows for effective protection of a large area by using small-scale treatments (e.g., herbicides or manual removal) applied directly to invasive species targets. Additionally, these figures should be viewed as only a subset of the achievements of HISC-funded projects: many of the projects HISC funds are research or outreach efforts that do not result in a standard deliverable that can be displayed on a map. The projects detection and control projects providing data for Table 2 and Figures 2 and 3 include the Invasive Species Committees, the Koolau Mountain Watershed Partnership, and field surveys completed by Dr. Mark Thorne at UH for the two-lined spittle bug on Hawaii Island.

Summaries of individual projects are available at <http://dlnr.hawaii.gov/hisc/projects/fy19-funded-projects/> and final project reports will be posted to this page as they become available.

Table 2: Summary Statistics for HISC-funded Detection and Control Projects in FY19

| County | Acres Surveyed | Acres Treated |
|--------|----------------|---------------|
| Kauai  | 20637          | 43            |
| Oahu   | 371263         | 4             |
| Maui   | 84682          | 484           |
| Hawaii | 169253         | 1076          |

Figure 2: Acres Surveyed and Treated for Invasive Species by Detection and Control Projects Supported by HISC Funding in FY19, Separated by House Districts

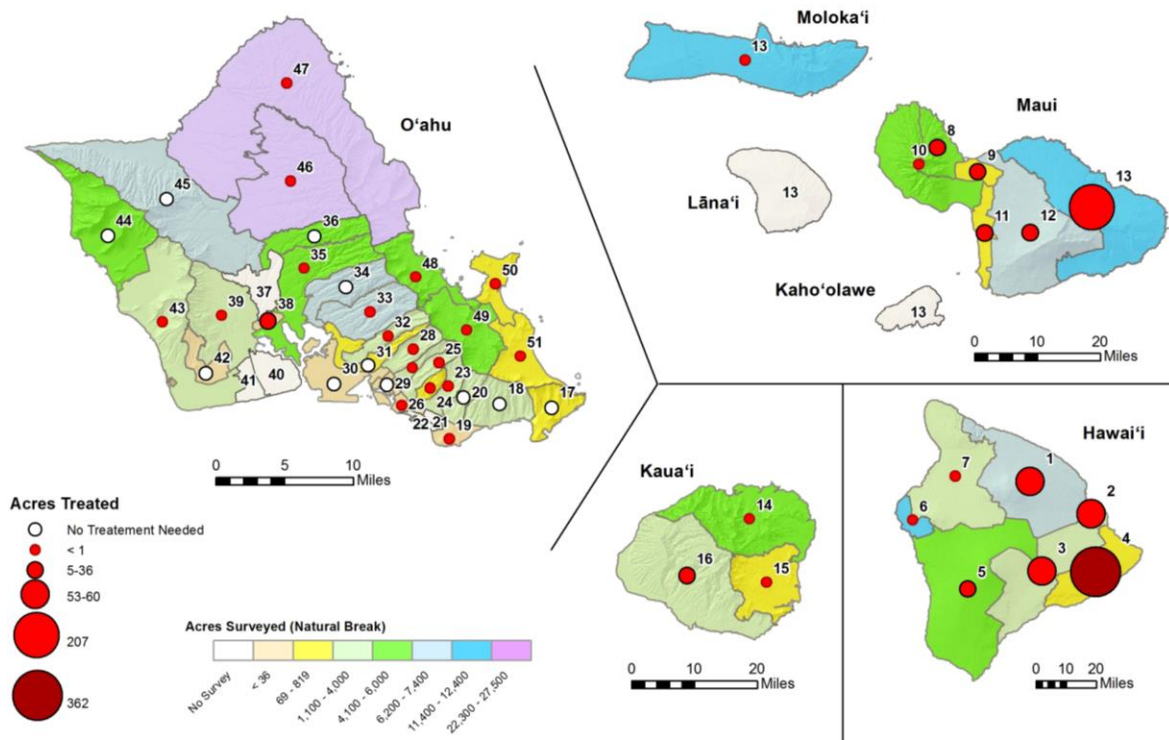


Figure 3: Acres Surveyed and Treated for Invasive Species by Detection and Control Projects Supported by HISC Funding in FY19, Separated by Senate Districts

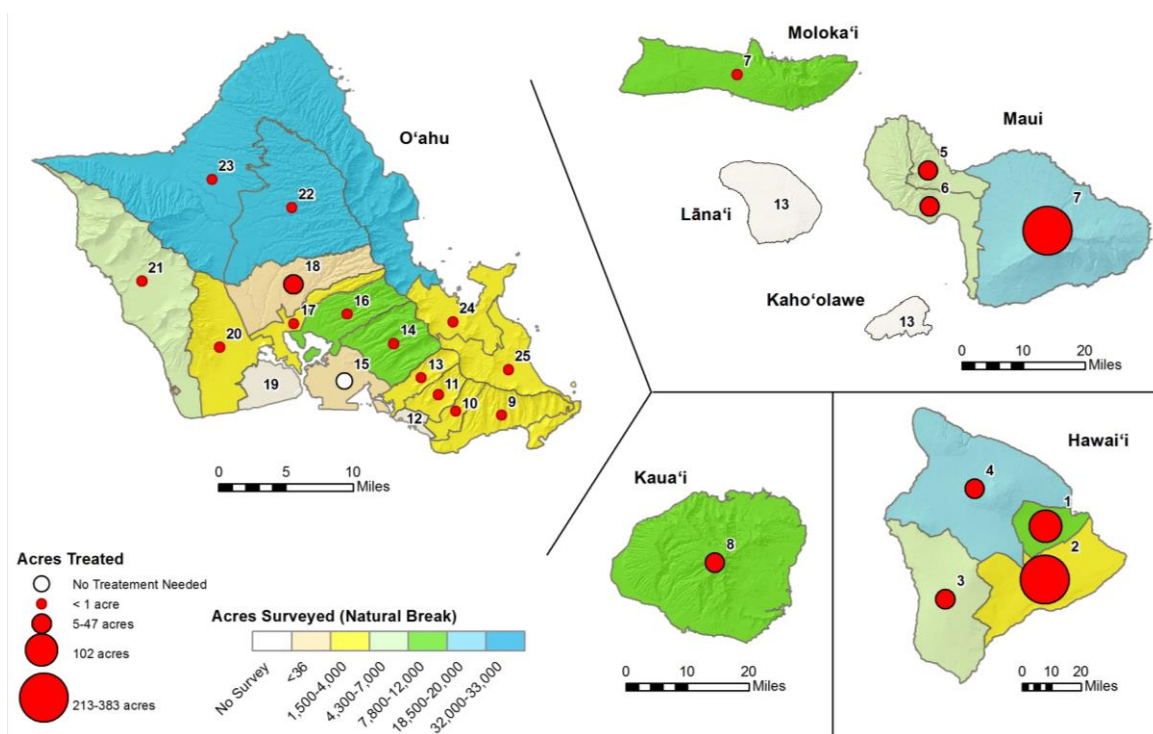


Table 3: Interagency Projects Funded by HISC in FY19\*

| Lead Agency      | Abbreviated Project Title                                    | Final award |
|------------------|--|-------------|
| Budget & Finance | 5% Expenditure Restriction                                   | \$237,500   |
| DLNR DOFAW       | DOFAW Overhead (6%)  | \$270,750   |
| HISC             | HISC Support Program   | \$303,591   |
| Bishop Museum    | Hawaii Early Detection Program                               | \$41,073    |
| DLNR DAR         | Ballast Water and Hull Fouling                               | \$85,000    |
| DLNR DAR         | Jellyfish Biosecurity  | \$1,907     |
| DLNR DOFAW       | Landscape-scale Mosquito Birth Control                       | \$58,502    |
| UH CTAHR         | Coconut Rhino Beetle Research and Response                   | \$100,000   |
| UH CTAHR         | Development of New Ant Baiting Tools, Year 2                 | \$55,000    |
| UH Botany        | Plant Informatics and Information Portal Development, Year 2 | \$33,753    |
| UH CTAHR         | Invasive Plant Research & Technology Capacity                | \$134,000   |
| UH HIMB          | Invasive Sponge Detection and Monitoring                     | \$49,145    |
| UH PCSU BIISC    | BIISC Outreach   | \$166,536   |
| UH PCSU BIISC    | BIISC ROD Response   | \$77,191    |
| UH PCSU BIISC    | BIISC Core Targets   | \$433,808   |
| UH PCSU CGAPS    | Coordinating Group on Alien Pest Species                     | \$62,000    |
| UH PCSU HAL      | Hawaii Ant Lab   | \$226,544   |
| UH PCSU KISC     | KISC Core Targets  | \$568,394   |
| UH PCSU KISC     | KISC Outreach  | \$84,042    |
| UH PCSU KMWP     | KMWP <i>Albizia</i> Control                                  | \$19,384    |
| UH PCSU MISC     | MISC Core Targets  | \$665,172   |
| UH PCSU MISC     | MISC Expansion of Little Fire Ant Mitigation in Nahiku       | \$125,322   |
| UH PCSU MISC     | MISC Outreach  | \$81,699    |
| UH PCSU OISC     | OISC Outreach  | \$80,974    |
| UH PCSU OISC     | OISC Plants  | \$433,808   |
| UH PCSU OISC     | OISC Pests   | \$125,322   |
| UH PCSU WRA      | Weed Risk Assessment   | \$112,838   |
| USDA USFS        | Biocontrol of Himalayan Ginger                               | \$21,208    |
| USDA USFS        | Biocontrol of High Priority Plants                           | \$77,121    |
| USDA NWRC        | Mongoose Toxicant Development, Year 2                        | \$18,414    |
|                  | Total  | \$4,750,000 |

\* Abbreviations

DLNR= Department of Land and Natural Resources; UH= University of Hawaii; USDA= US Department of Agriculture; USFS= US Forest Service; PCSU= Pacific Cooperative Studies Unit; MISC= Maui Invasive Species Committee; BIISC= Big Island Invasive Species Committee; OISC= Oahu Invasive Species Committee; KISC= Kauai Invasive Species Committee; WRA= Weed Risk Assessment; HAL= Hawaii Ant Lab; CGAPS= Coordinating Group on Alien Pest Species; CTAHR= College of Tropical Agriculture and Human Resources; KMWP= Koolau Mountain Watershed Partnership; NWRC= National Wildlife Research Center

**2.3 The Cost of Inaction: Examples of Invasive Species Costs in Hawaii**

Due to a lack of consistent funding for invasive species programs, many invasive species problems in Hawaii have become worse over the past decade. Coqui frogs have spread across Hawaii Island, exist in a handful of populations on Maui, and are intercepted regularly on Oahu in small numbers. In December 2013, Little Fire Ants, which had been found throughout the greater Hilo area and on Kauai for 10 years, were detected on Maui and Oahu. A new pest, Coconut Rhinoceros Beetle, was detected on Oahu in December 2013 and threatens to decimate Hawaii’s coconut palms. The invasive plant *Miconia* is beyond control on Hawaii Island and is at a critical point-of-no-return on Maui and Oahu. *Aedes aegypti*, a species of mosquito, has been detected at an increased frequency at Honolulu International Airport, and is a potential carrier of Zika, yellow fever, dengue fever, and chikungunya disease.

The relatively minimal cost of supporting invasive species prevention and control should be weighed against the potentially devastating economic impact that widespread invasive species can have in Hawaii. Notable examples include:

1. **Potential economic damages of Brown Tree Snake in Hawaii: estimated at \$2,140,000,000 annually.** A 2010 study by Schwiff et al. estimated that brown tree snake (*Boiga irregularis*, not yet found in Hawaii) impacts could cost \$2.14 billion annually in infrastructure and health costs as well as decreased tourism. This figure does not include the cost of conservation programs to mitigate the loss of native bird species.
2. **Economic damages of *Miconia* in Hawaii: estimated at \$672,000,000 annually.** The invasive plant *Miconia* (*Miconia calvescens*) was introduced by a private resident on Hawaii Island in the late 1950s and has since spread to all counties in the state. This fast-growing plant forms monocultures (a forest stand consisting of only one species) by invading forests and shading out competitors. *Miconia* is a prolific producer of seeds, which are dispersed by birds and may lay dormant in soil for 15 years or more (studies are still ongoing) before germinating. A 2007 study by Burnett et al. estimated annual damages in lost groundwater recharge and valuation of endangered bird species with habitat threatened by *Miconia* at \$672,000,000.
3. **Economic impact of Little Fire Ant on Hawaii Island: estimated at \$194,000,000 annually.** A 2013 study by Motoki et al. on the economics of Little Fire Ants (*Wasmannia auropunctata*) at estimates that without management, the damages on Hawaii Island alone in costs to nurseries, agriculture, residents, lodging, parks, schools, and other sectors could reach \$6.8B over the next 35 years, or \$194,000,000 annually. Total eradication of ants from Hawaii Island is not possible. A study published by Lee et al. in 2015 found that an immediate investment of \$8M over the next 2-3 years would avoid costs over the next 10 years totaling \$1.2B in control and \$129M in economic damages. The Hawaii Ant Lab, partially funded by the HISC, is currently the primary resource for research and response to Little Fire Ant incursions, with an annual budget between \$200,000-250,000. This species has been on Hawaii Island since 1999 and has since spread to Kauai (1999), Maui (multiple occurrences, most recently in 2013), and Oahu (2013), likely through interisland shipment of commodities.
4. **Potential economic impact of Red Imported Fire Ant: estimated at \$200,000,000 annually.** A 2007 study partially funded by the HISC estimated that the potential impact of red imported fire ant (*Solenopsis invicta*, not yet found in Hawaii) at roughly \$200 million annually within 10 years of introduction because of its impact on tourism, infrastructure and quality of life. (Gutrich et al., 2007).
5. **Economic loss in property value in Hawaii County due to of coqui frogs: estimated at \$7,600,000 annually.** A 2006 study of the economic impacts of *Eleutherodactylus coqui* in Hawaii by Dr. Brooks Kaiser (Gettysburg College) and Dr. Kimberly Burnett (University of Hawaii) highlights that, while coqui frogs present an ecological impact through the predation on native invertebrate communities, the primary economic impact is on property value. The frogs, which can reach densities of 55,000/acre, produce a call between 80-90 A-weighted decibels (dBA, a modified calculation of decibels based on the response of the human ear). For comparison, the Hawaii Department of Health sets the threshold for minimizing impacts to human health and welfare at 70 dBA (HRS 324F-1). The estimated damages to property values in Hawaii County as of 2006 was \$7,600,000 annually. This figure has likely increased as coqui frogs have continued to expand their distribution on Hawaii island since 2006. Should coqui frogs establish on Maui and Oahu, the annual loss in property value would drastically increase.

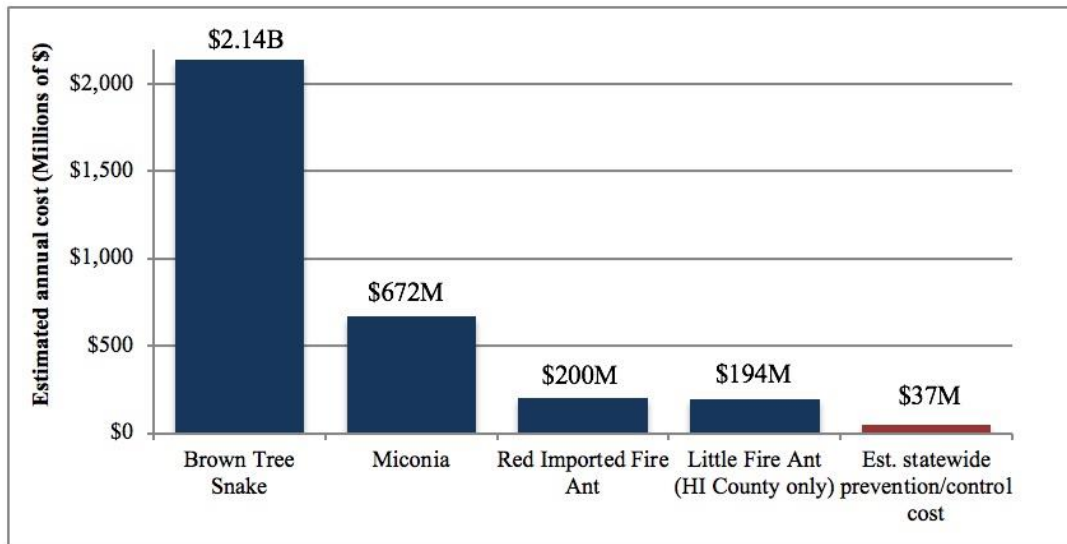


Fig 4: Examples of estimated economic damages from invasive species in Hawaii.

The Hawaii Interagency Biosecurity Plan (HIBP) estimates that an additional \$37M should be spent annually on invasive species programs in Hawaii in order to adequately mitigate invasive species impacts. The damages associated with invasive species far exceed the estimated cost for prevention and control programs. Investing in departmental programs (such as agricultural inspections and watershed management) and interagency projects under the HISC is an extremely cost-effective strategy for Hawaii. Full details of program needs and associated costs can be found in the HIBP at <http://dlnr.hawaii.gov/hisc/plans/hibp/>.

#### Literature cited

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### 3. Advice to the Governor and Legislature Regarding Invasive Species

Chapter 194, HRS, requires the HISC to advise the Governor and the legislature on issues regarding invasive species. The HISC fulfills this mandate by adopting resolutions, suggesting legislation, submitting testimony, and providing other relevant advice in this annual report.

#### 3.1 Recent HISC Resolutions

The HISC adopted two resolutions in FY19:

- [Resolution 19-1: Supporting the use of best available science in regulation of herbicides and recognizing the utility of glyphosate as a tool for invasive species control.](#) This resolution addresses the recent confusion in media and public discussion regarding the use of glyphosate, an herbicide commonly used in the control of weeds. The resolution supports the position paper of the Research and Technology Working Group titled [Understanding the Value of Glyphosate in Protecting Hawaii](#), which explains the differences between World Health Organization and US Environmental Protection Agency (EPA) assessments of glyphosate. The resolution supports the use of peer-reviewed science and reliance on regulatory expertise at HDOA and EPA in regulating the use of herbicides.
- [Resolution 19-2: Supporting the keeping of pet cats indoors and the use of peer-reviewed science in pursuing humane mitigation of the impacts of feral cats on wildlife and people.](#) This resolution recognizes feral and free-roaming cats as an invasive species that presents significant predation and disease risks to Hawaii's native species. The resolution urges pet owners to keep their cats indoors or enclosed in yards. Similar to Resolution 19-1, this resolution urges the use of peer-reviewed science in guiding regulatory decisions. In particular, the resolution urges policymakers to avoid a practice known as "Trap Neuter Return," or TNR, as a management tool. Though TNR is often advocated for by individuals representing humane animal treatment, scientific evaluations have shown that TNR does not work to reduce the number of feral and free roaming cats on the landscape.

All HISC resolutions are available at <http://dlnr.hawaii.gov/hisc/reports/resolutions/>.

#### 3.2 Review of the 2019 Legislative Session

The 2019 legislative session included roughly 40 measures relating to invasive species. The three measures that passed included:

- [SB0464, Relating to Private Property.](#) Authorizes a property owner or agent to enter adjacent property under certain conditions to eradicate *Albizia* trees before they become hazardous.
- [HB201, Relating to Invasive Species.](#) Clarifies that state, county, and authorized agents' authority to enter private property to control and eradicate invasive species also applies when there is a reasonable suspicion that invasive species are present on that property.
- [HB0297, Relating to Mosquito Vector Control.](#) Directs the Department of Agriculture (DOA) to review the *Aedes aegypti* mosquito with Wolbachia bacteria and place it on the appropriate animal import list. Requires DOA and the Department of Health to collaborate on a report to the legislature with recommendations for appropriate vector control programs.

The final FY20 budget bill included the following items relating to invasive species:

- Four specialist positions at HDOA Plant Quarantine Branch for import risk assessment
- CIP funds for a detector dog kennel
- A \$1M increase in funding to the HISC in order to support the Invasive Species Committee, coqui and LFA responses on Maui, biological control research, and landscape-scale mosquito-control technology



- CIP funds for a coqui frog containment fence on Maui, predator proof fences for Ka'ena Point Natural Area Reserve and Kanaha Pond Wildlife Sanctuary
- \$6M in CIP funds for watershed fencing
- \$750,000 in funding for rapid ohia death response

Measures that did not pass the 2019 session but are recommended for the 2020 session are described below. A full record of invasive species legislation from the 2019 session is available at <https://dlnr.hawaii.gov/hisc/files/2019/07/2019-Invasive-Species-Bill-Outcomes.pdf>.

### 3.3 Recommendations for the 2020 Legislative Session

The primary recommendation of the HISC to the legislature in 2020 is to continue to implement the goals of Hawaii Interagency Biosecurity Plan (HIBP), the State's 10-year vision roadmap to enhance biosecurity and invasive species mitigation (<http://dlnr.hawaii.gov/hisc/plans/hibp/>). The HIBP is an analysis of programmatic gaps and shortfalls within the State of Hawaii, with recommendations to enhance its core biosecurity programs. The legislature has made good progress in implementing goals of the HIBP in 2017-2019. Legislative achievements to date include:

- Fully restored the Vector Control Branch at Department of Health
- Appropriated planning funds for a new HDOA biological control facility
- Approved HDOA to use transitional facilities for commodity inspection
- Provided stable funds to the HISC by adding annual appropriation to base budget
- Added ten extension agents to UH College of Tropical Agriculture and Humane Resources
- Added two positions in FY19 for UH Hawaii Ant Lab to expand services in Kona

Key remaining legislative needs described by the HIBP include:

- Add positions at DLNR DOFAW for biosecurity (post-border control) in State protected areas
- Increase funding for critical biosecurity projects via HISC (LNR 402)
- Create a Biosecurity Emergency Response Fund
- Add additional positions for commodity inspections at HDOA Plant Quarantine
- Add additional positions at HDOA Plant Pest Control Branch
- Add base funding for the Invasive Species Committees and Hawaii Ant Lab to the UH budget
- Add research and extension positions relating to biosecurity at UH CTAHR
- Move enforcement of HDOA import laws under the new Environmental Court.

The legislature may wish to revisit the following items that were introduced in the 2019 session but did not pass:

- Nine invasive species technician positions and one forest pathologist for DLNR DOFAW
- Tax credits for the removal of dangerous *Albizia* trees (HB0571)
- Requiring disclosure of *Albizia* trees during real estate transactions (SB0443)
- Aquatic biosecurity fees and positions at the DLNR Division of Aquatic Resources (HB0746, HB0750, SB1162)
- A biosecurity omnibus bill providing positions and funds at multiple departments (SB0523)
- Creation of an invasive species emergency response fund (HB0561, SB0523)
- Increasing the portion of the Barrel Tax going to biosecurity programs at HDOA (SB0485)

### 3.4 Review of Relevant Administrative Rules

During the reporting period, administrative rules were updated at DLNR to prohibit the feeding of feral cats at small boat harbors. Feral cats (distinct from indoor, pet cats) are considered an invasive species due to their impacts on natural resources and human health.

In August 2019 HDOA adopted amendments Chapter 4-70, Hawaii Administrative Rules, “Plants and Non-Domestic Animal Quarantine, Plant Import Rules,” to add a new subchapter to restrict the importation of Myrtaceae (myrtle family) plants and plant parts to prevent the introduction of new strains of ohia rust, *Puccinia psidii*, a plant pathogen.